STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
AMENDED

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water *(Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)*

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 20, 1999	G2-29874		

NAME
Edgewater Beach Water Company

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
2831 Schirm Loop NW	Olympia	Washington	98502

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well #3

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	125	20

QUANTITY, TYPE OF USE, PERIOD OF USE
20 Acre-feet per year * Multiple domestic supply Year-round, as needed
*Supplemental to existing rights.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
300 feet West and 110 feet South of the Northwest corner of Government Lot 2.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
	9	19	2W	14	Thurston

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
3	15	Edgewater Beach Plat

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Plat of Edgewater Beach within Section 9, T. 19 N., R. 2 W.W.M.

DESCRIPTION OF PROPOSED WORKS

An 8" X 470' well.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	Completed	May 1, 2006

REPORT

BACKGROUND:

Under the provisions of Chapters 90.03 and 90.44 Revised Code of Washington (RCW), Edgewater Beach Water Company filed an application for a permit to withdraw public ground water from a well. A withdrawal rate of 125 gallons per minute (gpm) was requested for community domestic supply.

Edgewater Beach Water Company currently obtains its water supply from two wells, Wells #1 and #2, under Water Right Certificates Nos. G2-00389, G2-22214, and G2-26671C. Chloride and conductivity levels are elevated in Well #2, indicating that seawater has intruded into the aquifer. The high chloride level in water from Well #2, in conjunction with the low pH of the water from the wells, has resulted in corrosion of pipes and high copper levels in the water supply.

In order to comply with drinking water standards, Edgewater Beach Water Company requested authorization to withdraw water from a new well completed in a deeper aquifer. This application is being processed under the provisions of WAC 173-152-050, ahead of competing water right applications, to alleviate a public health and safety emergency.

Legal notice of the proposed appropriation was published in *The Olympian* on March 22 and 29, 2000. No protests were received as a result of this notice.

INVESTIGATIONS:

In consideration of this application, I researched Department of Ecology records of water rights and well construction reports. I also reviewed Dion and Sumioka, Water Supply Bulletin 56: Seawater Intrusion into Coastal Aquifers in Washington, 1978, and B.W. Drost, D.M. Ely, and W.E. Lu, II, Conceptual Model and Numerical Simulation of the Ground-Water Flow System in the Unconsolidated Sediments of Thurston County, Washington. On April 11, 2001, staff hydrogeologist Christine Neumiller and I conducted a field investigation of the project site.

The Edgewater Beach Water Company wells are located on the Griffen Peninsula, approximately five miles north of the city of Olympia, in Thurston County within Water Resource Inventory Area 14. Well #3 is situated approximately 500 feet east of Sanderson Harbor at the lower end of Eld Inlet.

Edgewater Beach Water Company currently serves 38 connections, 29 of which are permanent residences. The water system has two sources: 103-foot deep Well #1, and 120-foot deep Well #2.

Chloride and conductivity levels are elevated in Well #2, indicating seawater intrusion. The average chloride level in this well is 130 mg/L. The copper action level of 1.3 mg/L has been exceeded in the water supply due to corrosion (copper levels average 4.0 mg/L) resulting from the salinity and low pH of the water, posing a threat to public health. This application was filed to obtain authorization to withdraw water from a new well, Well #3, completed in a deeper aquifer unaffected by seawater intrusion.

Well Information

	Well #1	Well #2	Well #3
Wellhead elevation	75 feet above msl	90 feet above msl	90 feet above msl
Depth of completion	103 feet bgs = 28 feet below msl	120 feet bgs = 30 feet below msl	470 feet bgs = 380 feet below msl
Well screen	97-101.5 feet bgs	115-120 feet bgs	445-465 feet bgs
Static water level	71 feet bgs = 4 feet above msl	87 feet bgs = 3 feet above msl	69.6 feet bgs = 20.4 feet above msl
Pumping Capacity	10 gpm	50 gpm	100 gpm

Well #2 is located approximately 1,000 feet west of Well #1. Well #3, is situated approximately 10 feet south of Well #2. Well #3 will serve as the primary well for the water system. Wells #1 and #2 will serve as back-up sources.

Edgewater Beach Wells #1 and #2 are completed in sand and gravel deposits within what appears to be the uppermost portion of a geologic unit known as the TQu. This unit consists of an assemblage of undifferentiated glacial and non-glacial deposits of Tertiary and Quaternary age. The Qc or "sea-level aquifer" overlies the TQu.

Well #3 penetrates older sand and gravel deposits within the same geologic unit as Wells #1 and #2 (the TQu). However, the deeper aquifer in which Well #3 is completed is hydraulically separate from the uppermost TQu aquifer in which Wells #1 and #2 are completed. The well construction log indicates the presence of approximately 184 feet of clay and clay mixed with other sediments between the two aquifers. Presumably, this deeper TQu aquifer underlies and extends across Eld Inlet to Cooper Point and beyond. Ground water flow within the lower TQu aquifer is assumed to be toward Puget Sound, generally to the northeast.

Pumping Test Information

On March 30, 2000, Ecology issued a preliminary permit to Edgewater Beach Water Company to drill and test Well #3. On December 7, 2000, a 24-hour pumping test was conducted on Well #3 at a constant rate of 100 gpm. The static level was 69.6 feet below ground surface (20.4 feet above mean sea level) at the start of the test. The water level stabilized at 135.3 feet bgs after approximately three hours of pumping (the water level continued to fluctuate slightly – between 135.2 and 135.4 feet bgs - throughout the remainder of the test). The water level completely recovered to 69.6 feet bgs within three hours of turning off the pump.

Existing Rights for Edgewater Beach Water Company

Edgewater Beach Water Company's service area includes 70 lots that comprise Edgewater Beach Plat. The following water rights are appurtenant to the water system:

Water Right No.	Source	Annual Quantity in acre-ft/yr	Instantaneous Quantity In gpm
G2-00389C	Well #1	7	8
G2-22214C	Well #2	20*	70
G2-26671C	Well #1	20**	27 (primary)
Total		**20**	**105**

*7 acre-feet per year of which is "supplemental" (not additive) to annual quantity under Certificate #G2-00389
**Annual quantity is entirely "supplemental" (not additive) to existing rights

There is also a ground-water right claim, Claim #000439, on file for Edgewater Beach Water Company.

Potential Effects on Existing Rights

The following water right certificates and one senior application are on file for wells located within ½ mile of the Edgewater Beach wells:

Water Right Number	Name	QA Acre-ft/yr	QI Gpm	Approximate Depth Relative to msl
Cert. #G2-25149C	Thomas J. France	9.00	15	+25 ft msl
Cert. #G2-00083C	W J Dugaw	0.50	20	-50 ft msl
Cert. #G2-22736C	Richard Coombes	7.00	40	-65' and +21'
Cert. #G2-04159C	T. F. Schmidt	15.06	55	-80 ft msl
Cert. #G2-22590C	Delano Bradford	1.00	10	+78 ft msl
Appl. #G2-28416A (senior application)	John Schade	Not yet determined	40 requested	-185 ft msl

The nearest well to the Edgwater Beach Company water system east of Sanderson Harbor is the well originally owned by T. F. Schmidt under Certificate #G2-04159C. This 188.5-foot deep well, located approximately ¼ mile northeast of Well #3, has been used for single domestic supply and irrigation of five acres. The 75-foot deep France well, under Certificate #G2-25149C, is located approximately ¼ mile west, across Sanderson Harbor.

Well reports on file at Ecology indicate that there are at least 20 private wells situated within a half-mile radius of Well #3. Almost all of these wells are completed within the uppermost TQu aquifer or the Qc (sea-level) aquifer.

The following are the nearest wells on record completed in the same aquifer as Well #3:

- A 356-foot deep domestic well is located near Steamboat Island Road, approximately ½ mile northwest of Well #3.
- A 365-foot deep well operated by Cooper's Point Water Company is located across Eld Inlet, approximately ¾ mile southeast. This well is covered under Water Right Certificate #G2-00343.

DISCUSSION :

Potential for Seawater Intrusion

Well #3 is completed 380 feet below mean sea level and is located approximately 500 feet from Sanderson Harbor. These factors suggest the possibility that the well could experience seawater intrusion. Chloride and conductivity were monitored in the new well before, during, and after pumping for 24 hours at 100 gpm. Chloride levels remained relatively constant, ranging from 4 to 8 mg/liter (conductivity ranged from 210 to 220 micromhos/cm), throughout the duration of the test. These levels indicate that the aquifer has not been affected by seawater intrusion.

The static water level of approximately 69.6 feet below ground surface (20.4 feet above mean sea level) in Well #3 indicates the presence of considerable artesian pressure, providing a large amount (almost 400 feet) of available drawdown. This high hydraulic head also provides considerable protection against the intrusion of seawater into the lower aquifer. However, because of the proximity of the well to saltwater and because pumping at 125 gpm will cause the water level to drop below sea level, I recommend monitoring for chloride and conductivity annually. If chloride levels show an increasing trend or exceed 100 mg/L, the pumping rate will need to be reduced to reverse the intrusion of saltwater into the aquifer.

The ability to withdraw water from Well #3 as a primary source should allow the recovery of the upper TQu aquifer in which Well #2 is completed. With decreased use, chloride values in this well should recover to where the well can be used as a viable back-up source.

Potential Effect on Existing Rights

As mentioned above, the aquifer that Well #3 is completed in has a high hydraulic head and appears to be very productive. Due to the high head and the distance from the nearest wells (over ½ mile) completed within the same aquifer, it is extremely unlikely that pumping Well #3 up to 20 acre-feet per year at a rate of 125 gpm, would impair these wells.

The proposed Schade well, under Water Right Application #G2-28416, appears to target the same TQu aquifer as Edgewater Beach Company's Well #3. It will be located approximately 3/8 mile southwest of Well #3. An allocation of approximately 20 acre-feet per year should satisfy the demand for the proposed 40 homes under this application, if approved. Given the productivity of this aquifer, it should easily be able to supply both Edgewater Beach and the proposed Schade development.

Since Wells #1 and #2 will be delegated to back-up status, withdrawals from the uppermost TQu aquifer will be greatly decreased. There should be no impairment as a result of transferring demand to the deeper TQu aquifer as proposed.

Potential Effect on Surface Waters

A very small stream discharges to Sanderson Harbor from the north. However, this stream should not be affected by the proposed withdrawals since Well #3 is located on a peninsula ¼ mile south of the outlet of the stream and in an area where ground water is expected to discharge upwards toward the uppermost TQu and Qc aquifers or directly to the inlet.

Water Demand

Edgewater Beach Water Company currently serves 38 connections of which 29 are full-time residences. The water system could potentially serve 70 lots, but current lot ownership suggests that build-out to that extent is unlikely in the foreseeable future.

The maximum annual water use for this water system to date has been approximately 5.8 acre-feet per year. Based on current per connection water use, the existing annual quantity of 20 acre-feet per year appears to be adequate for the system.

FINDINGS AND CONCLUSION:

In accordance with Chapters 90.03 and 90.44 RCW, I find that:

- Water is available from the aquifer in which Well #3 is completed.
- The proposed use for community domestic supply is a beneficial use.
- The proposed withdrawals from the Well #3 should not impair existing rights or be detrimental to the public welfare.

RECOMMENDATIONS:

I recommend approval of this application and issuance of a permit to allow appropriation of ground water in the amount of 125 gallons per minute, 20 acre-feet per year. The period of use shall be year-round, as needed.

This permit is subject to all applicable State laws and regulations and the following provisions:

PROVISIONS:

"The total withdrawal of ground water by Edgewater Beach Water Company under this permit and Water Right Certificates Nos. G2-00389, G2-22214, and G2-26671C shall not exceed 20 acre-feet per year."

"Nothing in this approval shall be construed as lessening or enlarging any water rights represented by Water Right Claim No.000439. Any water rights confirmed for said claim as a result of a general adjudication through Superior Court, should adjudication be undertaken, shall not be additive to the 20 acre-foot maximum withdrawal allowed by this water system."

The water appropriated under this application will be used for public water supply. The State Board of Health rules require public water supply owners to obtain written approval from the Office of Water Supply, Department of Health, 1112 SE Quince Street, PO Box 47890, Olympia, Washington 98504-7890, prior to any new construction or alterations of a public water supply system.

Installation and maintenance of an access port as described in Chapter 173-160 is required. An air line and gauge may be installed in addition to the access port.

An approved metering device shall be installed and maintained in accordance with RCW 90.03.360, 90.44.450 and WAC 508-64-020 through –040, and WAC 508-12-030. Meter readings shall be recorded at least monthly.

In order to maintain a sustainable supply of water, pumping must be managed so that static water levels do not progressively decline from year to year. Water levels shall be measured and recorded annually in the month of August, using a consistent methodology. The length of the pumping period or recovery period prior to each measurement shall be constant, and shall be included in the record. Data shall be submitted annually, in the month of February, to the Department of Ecology. If static water levels show a declining trend, Ecology may require more frequent measurements.

Permittee or certificate holder, and its successor(s) shall provide data on chloride concentrations for the well authorized by this permit or certificate with analysis performed by a state accredited laboratory. Accreditation information may be obtained from Ecology's Quality Assurance Program at (360) 895-4649. Measure chloride concentrations and electrical conductivity once a year in the month of August, in Wells No's. 2 and 3 for the first 3 years, then annually thereafter, in Well #3. Data shall be submitted to the Department of Ecology, Southwest Regional Office, Olympia, Washington in the month of February.

If pumping of the well authorized by this permit or certificate causes chloride concentrations to exceed 100 milligrams per liter, immediate action shall be required to prevent concentrations from increasing (such as reducing the instantaneous withdrawal rate (gpm) of the well). If corrective measures fail to prevent chloride concentrations from exceeding said level in the future, permittee or certificate holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Water-pumpage, water quality, and static-water-level data, along with a summary and analysis of the data, shall be submitted annually in the month of February, or more frequently upon request, to Ecology's Southwest Regional Office Water Resources Program. The data shall be submitted in digital format (ASCII) and shall include the following elements:

For Water Use Reporting:

1. Measurement method (totaling meter, acoustic meter, etc.) for each well
2. Total volume pumped from each well by month in thousands or millions of gallons
3. Unique Well ID number

For Water Level Reporting:

1. Unique Well ID Number
2. Measurement date and time
3. Measurement method (air line, electric tape, pressure transducer, etc.)
4. Well status (pumping, recently pumped, etc.)
5. Water level accuracy (to nearest foot, tenth of foot, etc.)
6. Description of the measuring point (top of casing, sounding tube, etc.)
7. Measuring point elevation above or below land surface to the nearest 0.1 foot
8. Land surface elevation at the well head to the nearest foot.
9. Static water level below measuring point to the nearest 0.1 foot.

For Water Quality Monitoring:

1. Unique Well ID Number
2. Sampling date and time
3. Chloride concentration (mg/L)
4. Submit paper copy of laboratory report

The Water Resources Act of 1971, Chapter 90.54 RCW specifies certain criteria regarding utilization and management of the waters of the State in the best public interest. Favorable consideration of this application has been based on sufficient waters available, at least during portions of the year. However, it is pointed out to the applicant that this use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

Issuance of this water right is subject to the implementation of the minimum requirements established in the Conservation Planning Requirements, Guideline and Requirements for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs, July 1994, and as revised.

Under RCW 90.03.005 and 90.54.020(6), conservation and improved water use efficiency must be emphasized in the management of the State's water resources, and must be considered as a potential new source of water. Accordingly, as part of the terms of this water right, the applicant shall prepare and implement a water conservation plan approved by Department of Health. The standards for such a plan may be obtained from either the Department of Health or the Department of Ecology.

The applicant is advised that notice of Proof of Appropriation of water (under which the final certificate of water right is issued) should not be filed until the permanent distribution system has been constructed and that quantity of water allocated by the permit to the extent water is required, has been put to full beneficial use.

REPORTED BY: Maire Peter Date: July 2, 2001

The statutory permit fee for this application is $20.00.

FINDINGS OF FACT AND DECISION

Upon reviewing the above report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find water is available for appropriation and the appropriation as recommended is a beneficial use and will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER a permit be issued under Ground Water Application Number G2-29874, subject to existing rights and indicated provisions, to allow appropriation of public ground water for the amount and uses specified in the foregoing report.

Signed at Olympia, Washington, this 2nd day of July, 2001.

J. Mike Harris
Water Resources Supervisor
Southwest Regional Office